

Listing of Claims

IN THE CLAIMS:

The following listing of claims is intended to supercede all previously filed listings of claims. Changes are shown with deletions in ~~striketrough~~ and additions underlined.

Claim 1 (Currently Amended). A method for aseptically filling a package having an inside, a filling aperture, and a membrane fitted over the filling aperture the membrane being configured to be disposed in a first position in which the membrane is substantially impenetrable to vapour and a second position in which the membrane has been displaced to permit the insertion of an elongated member into the package, the method comprising the steps of:

filling the inside of the package with a sterilizing vapour by configuring the membrane to be disposed in the second position;

holding the sterilizing vapour on the inside of the package for a sufficient amount of time to sterilize the inside of the package by configuring the membrane to be disposed in the first position;

removing a portion of the sterilizing vapour;

filling the package with a product;

capping the filling aperture of the package containing the product;

wherein the membrane is in place over the filling aperture during all steps of the method.

Claim 2 (Original). The method of claim 1, further comprising the step of allowing a sufficient quantity of the sterilizing vapour to exit the package before filling the package with a product to avoid affecting the quality of the product, wherein the sterilizing vapour exits the package and sterilizes a part of a filling device that comes into contact with the product.

Claim 3 (Original). The method of claim 1, wherein the membrane material is an elastomer selected from the group consisting of silicone rubber, natural rubber, butadiene, nitrile, sulphonic, isoprene, polyurethane, and viton.

Claim 4 (Original). The method of claim 1, wherein the membrane opens to greater than about 10% of the area of the filling aperture during the filling steps.

Claim 5 (Original). The method of claim 2, further comprising the step of displacing the sterilizing vapour with sterile air, wherein the sterile air forms a headspace of the capped package.

Claim 6 (Original). The method of claim 2, further comprising the step of displacing the sterilizing vapour with inert, sterile gas, wherein the inert sterile gas forms a headspace of the capped package.

Claim 7 (Original). The method of claim 2, further comprising the step of pressing the membrane segments tightly against inner walls of the package to accelerate displacement of the sterilizing vapour by eliminating the gap between membrane segments and the inside of the package.

Claim 8 (Original). The method of claim 1, further comprising the step of allowing the sterilizing vapour to exit from the package during the step of filling the package with sterilizing vapour, wherein the sterilizing vapour that exits the package sterilizes an external surface of the package.

Claim 9 (Original). The method of claim 1, further comprising the step of conveying the package between the filling steps and the capping step in a non-sterile atmosphere, wherein the inside of the package remains substantially free of microbiological contamination.

Claim 10 (Original). The method of claim 1, further comprising the step of wetting the membrane with a fluid, wherein the wetted membrane has an increased ability to prevent entry of contaminants.

Claim 11 (Original). The method of claim 10, wherein the fluid contains a bactericide and a thickener to increase the viscosity of the fluid.

Claim 12 (Original). The method of claim 1, further comprising the step of heating the package, wherein the heating increases the internal pressure of the gas in the package, and enhances prevention of entry of contaminants into the package.

Claim 13 (Original). The method of claim 1, wherein the method is performed using conventional non-aseptic filling equipment adapted to fill aseptically.

Claim 14 (Original). The method of claim 13, wherein the non-aseptic filling equipment is used aseptically part time.

Claim 15 (Original). The method of claim 1, further comprising the step of sterilizing an outside surface of the membrane before the capping step.

Claim 16 (Original). The method of claim 15, wherein the step of sterilizing an outside surface of the membrane is achieved with a sterilizing medium that has a sterilizing effect of limited duration.

Claim 17 (Original). The method of claim 15, wherein the step of sterilizing an outside surface of the membrane is achieved with a sterilizing medium that does not affect the quality of the product in small amounts.

Claim 18 (Original). The method of claim 1, further comprising the step of rinsing the parts of the filling device that come in contact with the product to be filled with hot water after each filling step.

Claim 19 (Original). The method of claim 18, further comprising the step of sterilizing the parts of the filling device that come in contact with the product to be filled between filling operations by spraying with chlorinated water, by ultraviolet light, by enclosing in sterilizing vapour, or any combination thereof.

Claim 20 (Currently Amended). A system for aseptically filling a package having a filling aperture, the system comprising:

- a membrane over the filling aperture of the package;
- a means for filling the inside of the package with sterilizing vapour;
- ~~a means for~~ the membrane being configured to hold ~~holding~~ the sterilizing vapour inside the package for a time sufficient to sterilize internal contact parts of the package and membrane;
- a filling device for filling the package with a product without removing the membrane, the sterilizing vapour being released from the package through the membrane prior to the filling of the package, the sterilizing vapour sterilizing a part of a filling device that comes into contact with the product;
- ~~a means for removing a sufficient quantity of the sterilizing vapour from the package before filling the package with a product to avoid affecting the quality of the product, wherein the sterilizing vapour exits the package and sterilizes a part of a filling device that comes into contact with the product;~~
- ~~a means for capping~~ a capping mechanism for capping the package without removing the membrane.

Claim 21 (Original). The system of claim 20, wherein the membrane is an elastomer selected from the group consisting of silicone rubber, natural rubber, butadiene, nitrile, sulphonic, isoprene, polyurethane, and viton.

Claim 22 (Original). The system of claim 20, wherein a sprung insert replaces a conventional sealing material on the filling device and holds the membrane in place over the filling aperture during insertion of filling machine parts.

Claim 23 (Original). The system of claim 20, wherein the membrane opens to greater than 10% of the area of the aperture.

Claim 24 (Original). The system of claim 22, wherein the sprung insert provides a vapour seal in conjunction with the membrane.

Claim 25 (Original). The system of claim 22, further comprising conveyors to and from the filling device and the means for filling, wherein the conveyors are partly or wholly fitted with covers that contain sterilizing vapour to sterilize the outer surfaces of the package.

Claim 26 (Original). The system of claim 22, wherein the sterilizing vapour is expelled through a snift valve of the filling device.

Claims 27-53 (Cancelled).

Claim 54 (New). A method of adapting a non-aseptic filling line to be an aseptic filling line, the method comprising:

- disposing a membrane proximate to a filling aperture of a package, the membrane being configured to be disposed in a first position in which the membrane is substantially impenetrable to vapour and a second position in which the membrane has been displaced to permit the insertion of an elongated member into the package;

- providing a sterilizing medium delivery member, the sterilizing medium delivery member being configured to fill the inside of the package with a sterilizing medium by configuring the membrane to be disposed in the second position;

- configuring the membrane to be disposed in a first position whereby the sterilizing medium is substantially held within the package;

- configuring a filling valve to be substantially sealed against a surface portion of the membrane;

configuring the filling valve to configure the membrane to be disposed in the second position allowing the sterilizing medium to exit the package and permitting the filling of the package with a product; and

providing a second valve, the second valve being configured to permit the flow of the sterilizing medium from the package.

Claim 55 (New). The method of claim 54, wherein the sterilizing medium passes over at least part of the filling valve, thereby substantially sterilizing at least parts of the filling valve.

Claim 56 (New). The method of claim 55, wherein the step of filling the package with a sterilizing medium is performed in a substantially enclosed portion of the filling line.

Claim 57 (New). The method of claim 54, wherein the step of configuring a filling valve to be substantially sealed against a surface portion of the membrane includes fitting the filling valve with a facing member, the facing member being configured to form a seal with a portion of the membrane.

Claim 58 (New). The method of claim 57, wherein the step of fitting the filling valve with a facing member includes fitting the filling valve with a sprung face member.

Claim 59 (New). The method of claim 54, wherein the step of providing a second valve includes providing a sniff valve to configured to permit the flow of the sterilizing medium from the package.

Claim 60 (New). The method of claim 54, wherein the step of configuring the filling valve being to displace the membrane to permit the sterilizing medium to exit the package and to permit the filling of the bottle includes providing a collar member, the collar member being configured to displace at least a portion of the membrane from the first position.

Claim 61 (New). The method of claim 54, further comprising:

conveying the package from a filling location to a capping location in a non-aseptic environment, the contents of the package remaining substantially free of microbiological contamination during conveyance of the package prior to capping of the package.

Claim 62 (New). The method of claim 54, further comprising:

conveying the package from a location for filling the package with a sterilizing medium to a filling location, the package having the sterilizing medium substantially sealed inside of the package while the package is being conveyed.

Claim 63 (New). The method of claim 55, further comprising:

sterilizing the fill valve using at least one of the following sterilization processes: imparting UV radiation on the fill valve, imparting steam on the fill valve, rinsing the fill valve in hot water, and rinsing the fill valve in a bath containing a bactericide.

Claim 64 (New). The method of claim 55, further comprising:

providing a cover, the cover being configured to permit the sterilizing medium to flow around the filling valve.

Claim 65 (New). The method of claim 54, further comprising:

disposing a cap over the membrane, whereby the membrane becomes integral to the cap after the cap is disposed over the cap.

Claim 66 (New). The method of claim 1, further comprising:

conveying the package from a location for filling the package with a sterilizing vapour to a filling location, the package having the sterilizing medium substantially sealed inside of the package while the package is being conveyed.

Claim 67 (New). The method of claim 20, wherein the sterilizing vapour is held inside of the package as it is conveyed between a location where the package is filled with the sterilizing vapour and a filling location.

Claim 68 (New). The method of claim 1, further comprising:
disposing a cap over the membrane, whereby the membrane becomes integral to the cap after the cap is disposed over the membrane.

Claim 69 (New). The system of claim 20, wherein the capping mechanism is configured to dispose the cap over the membrane, whereby the membrane becomes integral to the cap after the cap is disposed over the membrane.